J. S. BACH'S ORGAN AS COMPARED WITH THE "BAROQUE ORGAN" OF THE TWENTIETH CENTURY

Arthur H. Hauge

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J. S. BACH'S ORGAN AS COMPARED WITH THE "BAROQUE ORGAN" OF THE TWENTIETH CENTURY

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CHAPTER ONE

HISTORY OF THE ORGAN

Is the modern Baroque organ at the Germanic Museum at Harvard University in Cambridge, Massachusetts, or any other instrument in that style, identical in tonal articulation with the one on which Bach played at St. Thomas's in Leipzig two centuries ago? The authenticity of our modern Baroque instruments has been for some time the subject for vigorous discussion among music students and music lovers. The increasing interest in this controversy, as manifested by the appearance of numerous articles in our current publications, has grown to include both organ designers and builders as well. The following chapters will be an attempt to gather the pertinent data so as to provide the foundation for an exact comparison between the old and new instruments. As an introduction to this comparison it will be necessary to follow up the history of the organ from its earliest beginnings to the time of Bach.

Legend seems to trace the origin of the organ to the primeval pipes of Pan, who, according to the myth, originated the syrinx.

> The pipes of the syrinx being composed of reeds cut off just below the knot--which knot did not permit the wind to escape, but caused it to return to the same place where it entered, thus traversing the length of the tube, twice--were in principle so many examples of the first class of pipes of varied growths or diameters, and of graduated lengths, bound together in a row, with their open tops arranged in a horizontal line, and would form

> an instrument possessing sufficient capacity for the performance of primitive melodies. They were practically 'Stopped pipes' producing a sound nearly an octave lower than that of an open pipe of the same length.[1]

To play on this instrument must indeed have been difficult, for the only means of wind supply was from the mouth, but finally the idea occurred of conducting the supply of wind into the pipe from below with the use of an arm-operated bellows. However, the invention of the Greek organ, the hydraulis, was to make wide sweeping innovations which greatly improved the old system, and was also to be the forerunner of our modern organ.

The invention of the hydraulis is accredited to Ctesibus (250 B.C.), and after undergoing various changes and improvements, it became the popular instrument of the gladiatorial shows and musical contests. The tone of the instrument was loud and penetrating.

> Air was pumped into a hemispherical container standing in a cylinder half filled with water. This water, acting in a similar manner to the weights used on the wind-reservoirs of later Organs, held the air under constant pressure. From this container a tube led to cross channels furnished with flue-pipes, which were made to sound by means of a simple but ingenious system of keys. In later instruments we find several series of pipes in various keys, and these--like the registers of an organ--could be cut out or brought in by taps placed at the side of the instrument.[2]

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[1]Thomas Elliston, "Organ," Grove's Dictionary of Music and Musicians (Volume III Third Edition, edited by H. C. Colles, M.A. New York: The Mac Millan Company 1936), p. 735.

[2]Karl Geiringer, Musical Instruments (London: George Allen & Unwin Ltd., Museum Street, 1943), p. 63.

A clay model of an hydraulis, which was made at the beginning of the second century A. D., was found in Carthage. This example clearly showed sets of pipes, one behind the other. Although the model did not indicate different types of pipes, there were differences in size. The third row was nearly twice as tall as the front row, while the middle row had an intermediate height. The hydraulis enjoyed its chief popularity during the Roman Empire, but the instrument in its original form scarcely survived the first centuries A. D. Its most important feature, the cylinder half filled with water into which air was pumped, had vanished. Instead of this complicated contrivance, a new model of the organ, which was introduced by the Byzantines into Franconia during the reigns of Pepin and Charlemagne, was substituted. At first it was used for secular gatherings only.

The exact period when the organ was first introduced into religious ceremonies is not definitely known, but by the seventh century it was used to improve the singing in the congregations. Thus the demand for organs increased, so that by the ninth and tenth centuries the "making and using of organs was so great in Germany, that Pope John VIII (880), in a letter to Anno, Bishop of Friesinger, requested that a good organ may be sent to him, and a skillfull player to instruct the Roman artists."[1]

The early history of the organ culminated in the large instrument erected in 980 in the monastery at Winchester, England. It had twenty-six bellows, but the action of these primitive

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[1]Thomas Elliston, "Organ," Grove's Dictionary of Music and Musicians, p. 738.

bellows, without any contrivance for stabilizing the pressure, doubtlessly resulted in sudden starts and fadings. This instrument, boasting two keyboards, required two men to play it. Large organs, such as this one, had several pipes for the same key, either in unison or in fifths, octave, twelfths or double octaves, which sounded at once. Too stops existed to disconnect some of them in order to change the timbre or volume. It was claimed that these organs could equal the roar of thunder. Although the players could not rely on stops to produce a difference in tone, they devised a way in which variety could be achieved: in Medieval organs the width of the pipes did not change in proportion to the length as in modern organs, and therefore the higher pipes, relatively too thick, had a comparatively soft timbre. As a way out, then, to get a difference in tone, the player used alternately the higher, middle, and lower registers of the keyboard. This method was probably not altogether satisfactory, but it was at least an attempt at obtaining contrast in timbre.

From the tenth to the early fourteenth century, organs had many ranks of pipes (some had up to twenty), which formed a powerful mixture, but they lacked any means of registration, such as what we now call stops. There were keyboards of "three octaves with a number of semitones, particularly in the middle range. The earliest preserved examples of organ music, dating from about 1325, require a complete chromatic middle-octave."[1]

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[1]Wili Apel, "History of Organ," Harvard Dictionary of Music (Wili Apel, Cambridge, Massachusetts: Harvard University Press, 1944), p. 531.

The development of the organ after 1325 made tremendous and rapid strides not only in the refinement of sound technique but also in the enlargement of the instrument. In 1361 an organ with three keyboards and a pedal board was built in the Halberstadt Cathedral.

> The introduction of the pedals was probably due to the fact that with the larger pipes a particularly great effort was required to overcome the heavy air-pressure in giving the wind access to the pipes. This effort was exerted more easily by the feet than by the hands, a fact which gave rise to the notion of contriving a keyboard for the feet.[1]

The Halberstadt organ is the earliest instrument to which we can point as covering the chromatic scale. According to Praetorius the two middle manuals were used for ordinary two-part playing, while the descant, sounding thirty-two to fifty-six pipes, and the pedal, sixteen to twenty-four pipes, were employed to produce particularly powerful effects.

Simultaneous with the manufacture of the big organs came the development of the small portatives and positives. The portative belonged to the Middle Ages, being used for processions and for domestic music. It was suspended from the player's neck with the keyboard running outward, easily available to the right hand. The left hand worked the triangular feeder bellows. The fifteenth century saw the prime of the portative, it having completely vanished in the sixteenth.

The positive was a small stationary chamber organ. It consisted mostly of flue-stops, and much later this name was given

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[1]Geiringer, Musical Instruments, p. 103.

to a section of the organ in which flue-stops prevailed. This instrument was admirably suited to accompany the choir. It has ever since been synonymous with the choir organ. The famous painting by van Eyck of the Altar of Ghent reveals, in one of the panels, a positive organ of moderate size. It is probably the latter type of organ, the positive, which must be considered as having been instrumental in the development of polyphonic organ music. Though the keyboards of medieval church organs were clumsy and unmanageable, and only adapted for playing in unison with the plainsong, this was not the case with positives and portatives. We know from pictures and statuary that these had practicable bellows, in addition to a keyboard playable with the fingers and more or less completely chromatic, for centuries before such a keyboard was applied to the church organ. It is true that some of the early paintings show that the keys were very short, projecting only about an inch from the case, but they developed soon to a more practicable type.

In the fifteenth and sixteenth centuries, progress in the making of organs brought forth solo stops which were gradually added to the basic mixture tone of flutes, stopped diapasons, and reeds. These two centuries were particularly prolific in their improvements of the keys, pedals, wind-supply, and other mechanical devices.

One of the first endeavors was to obtain more than one strength of tone from the same manual. In order to prevent some of the sets of pipes from speaking when they should be silent, a sliding-board was placed at the base of these pipes over the

valves that opened and closed the entrance for the wind. These sliding-boards were operated by registers, or stops. By this device [illegible] effects were obtained from one organ and one [illegible] key. By this means, also, power was created by using each separate set of pipes, singly or in a desired combination. For the first time stops received distinctive names, such as Principal, Octave, etc.

In the course of the fifteenth century, the keys were reduced in size. The long and short keys appeared. The naturals were about an inch and three quarters in width, two inches and three-eighths in length and were placed in front of the short keys. The short keys were three inches long and an inch wide, and stood an inch and a half above the naturals. The keys were lettered, but because the clavier was becoming so well known, the lettering began to fall into disuse in the 1600's. By the seventeenth an octave was brought within about a note of its present width. The keyboards during this period were of contrasting materials, the upper keys ivory and the under keys ebony, just the reverse of what we have today.

The invention of the pedal is one of the most important improvements made during the fifteenth and next two centuries. At first the pedal board did not exceed an octave in compass, and consisted of the diatonic notes only B♭, C, D, E, F, G, A, B♭. The pedal keyboard was used mainly to hold long sustained sounds and it was operated on the manual clavier by a series of cords. Soon the pedals received the important addition of independent pedal-pipes, and thus began the pedal organ which had added so

much majesty and dignity to the tone of the organ. During these two centuries the pedal compass was extended and semitones were introduced. A new system of direct contact with the pipes was employed, thus dispensing with the old and entirely unsatisfactory operation of the rope action. Any 32 foot stops were separated from the manual and used together with the other pedal registers exclusively.

As the years brought larger and more powerful instruments, the difficult problem of wind supply increased. Hand bellows were no longer able to supply wind either in quantity or strength. A great improvement in this instance came with the invention of a series of bellows, each bellows being equipped with a wooden shoe into which the blower placed the foot. By holding on to a transverse bar, he would lower one foot as he raised the other, thereby blowing two bellows at the same time. This was a great improvement over some of the cruder earlier bellows, but even here uniform strength of wind supply could never be obtained. Consequently, the organ might often sound out of tune. By the beginning of the seventeenth century an organ had been developed that had contrasting timbres of strongly individual sonorities, several manuals, and a pedal organ. An instrument had emerged which had all the basic contrivances of a real organ. During the next two centuries constant improvements were made which finally resulted in the Baroque organ of Bach's time.

The culmination of techniques in organ building during the eighteenth century made possible such performance of the impor-

tant organ music of that period as heretofore never had been attained. The intricate polyphony of Bach's organ composition called masterfully upon every resource of the instrument. The Baroque organ bespoke forcibly and intellectually the master works of that century. It is not difficult to understand, then, that such a fertile period in organ composition should be simultaneously paralleled by an equally productive era in the manufacture of organs for performance of these works. The Baroque organ of the eighteenth century became a milestone in the history of organ building. It was "sufficient unto the need" of that day.

It will be tried in the following chapters to delineate the essences of the eighteenth century instrument, its possibilities and its limitations, and trace in detail the evolution of the organ from the time of Bach up through the twentieth century. As we proceed from one aspect to the next, we shall probably discover numerous thought-stimulating side issues that entreat our attention: Would it be feasible today to build an organ that would encompass both the eighteenth century Baroque and "romantic" constituents in one case? Is it possible to obtain "classic" effects on a "romantic" instrument, and vice versa? Our chief concern here is to compare the Bach organ with the modern Baroque instrument.

C H A P T E R T W O

SOME DEFINITIONS

Before we move on in our discussion, it might be valuable to clarify, by definition, some of the essential terms and technical expressions concerning organs as they will apply in this particular analysis. As a convenient means of classification, we shall group our definitions under three headings: (1) external features of the organ, (2) internal features of the organ, and (3) miscellaneous features of the organ.

I. External features of the organ

A. Console. The case which encloses the keyboard, stops, etc., of an organ is known as the console. Formerly, it was placed in front of, and was attached to, the organ. Now, it is often detached, the sole connection being an electric cable.

B. Keyboard. The whole set or sets of keys, such as in pianos, organs, harpsichords, etc., is called the keyboard. It is also referred to as the manual.

C. Stops. The handle by which the player can draw on or shut off the various registers. The stops acting on pipes are

more specifically called sounding stops, as distinct from those which control couplers and similar mechanical devices.

The organ of Bach's time usually had two, or at the most, three keyboards or manuals. They are called Hauptwerk or Oberwerk, Brustwerk, and Rückpositiv.

D. Hauptwerk or Oberwerk. This seems to correspond more or less closely to our Great organ, "and to have contained the stops most usually employed when special effects were not wanted."[1] Oberwerk means literally the upper keyboard, or Great Organ.

F. Brustwerk. This corresponds to our swell organ. It contained a special group of smaller organ pipes placed in the middle of the front of the organ, between the large pedal pipes. It is of softer intonation than the Hauptwerk and is usually played on the second manual. The Brustwerk took its name from the fact that its pipes faced the player. It may be regarded as equivalent to the Swell organ, though its pipes

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[1] The Oxford History of Music, The Age of Bach and Handel, by J. A. Fuller Maitland. (London: At the Clarendon Press: 1902), Volume IV p. 103.

were not in Bach's time enclosed in a box.

If the word swell is used in regard to organs played by Bach, it is merely to designate the third manual; it by no means implies that the pipes belonging to that keyboard were enclosed in a swell-box. Although this invention was applied to an English organ for the first time in 1712 (St. Magnus Church, London Bridge) its adoption in Germany has become general only within comparatively recent years, and then only in newly-built instruments.[1]

F. The Rückpositiv. This is the exact equivalent of our choir organ. It consisted of a group of pipes placed at the player's back, often serving as a screen between him and the congregation below him. The Rückpositiv was so called because its pipes were at the organist's back (Rücken).

II. Internal features of the organ. The pipes of the organ fall into two distinct classes--Flue and Reed. First we shall discuss flue pipes and their members and then reed pipes and their family.

A. Flue pipe family. The flue pipe closely resembles the ordinary tin whistle in which a vibrating air sheet sets up vibrations in the column of air surrounded by the pipe. The complete flue comprises the following component parts: the cylindrical portion which encloses the column of air just mentioned and which is known as the "body"; the "foot" which is usually

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[1] Andre Pirro, Johann Sebastian Bach, The Organist and His Works for the Organ, Translated by Wallace Goodrich, Preface by C. M. Widor, (New York: G. Schirmer and Company, 1902), p. 75.

a tapered cone connecting the body to the wind supply from the chest; the "mouth" which consists of a rectangular opening cut from the body at the point where the foot joins it. At the location of the mouth, the body of the pipe and the conical foot are flattened. The straight edge thus formed at the top of the mouth is called the "lip". The "languard" consists of a flat piece of metal located internally at the top of the foot at the point where it joins the body. The front edge is beveled and arranged so as to form a narrow slit through which the wind sheet issues. The slit is known as the "flue". Lugs soldered to the pipe at the sides of the mouth are known as "ears" and assist in controlling the wind sheet. Flue pipes are tuned by lengthening or shortening the pipe. Flue pipes may be either open or stopped, that is to say, the top of the body may be completely open to the surrounding air, or a stopper or plug may be inserted at the top of the pipe. The stopping of the open end causes the pipe to speak a note one octave lower than it would if left open. In other words, a pipe, having a normal speaking length of four foot C, would sound eight foot C if closed or stopped. The stopping also causes the even-numbered harmonics of the tone to be suppressed. All flue pipes fall into one of the following classes of tone: Principal, or Diapason; Flute; String.

1. <u>Principal</u>. In German organs, the open diapason in 4' 8' 16' and 32'

2. <u>Quintaton</u>. This is a Stopped Flute pipe, and can be made either of wood or metal. It is characterized by having the third harmonic developed equally with the fundamental. A quaint tone results, which has con-

siderable value in combinational use. It often has a light and transparent tone.

3. Gemshorn. This is a sort of hybrid pipe, since the tone lies midway between that of the Principal and Flute, or Flute and String. The body of this pipe takes the form of an inverted cone. This construction brings into prominence the second harmonic.

4. Octave. This is an open metal, cylindrical organ stop of four foot on the manual and eight foot on the pedal. The scale and strength of the tone are determined by the Open Diapason in the same department.

5. Spielpfeife. This is a species of Flute stop.

B. Reed Pipe Stops. The reeds are of three categories: Chorus reeds, Semi-chorus reeds, and Solo, or orchestral reeds. Chorus reeds belong chiefly to the Trumpet family. Semi-chorus reeds come to us largely from the Baroque period, and are not imitative, although their names may suggest an orchestral background. The Cromorne, Schalmei and the Rankett may be taken as typical examples.

The term semi-chorus is used because these stops may function as chorus reeds, solo stops, or merely timbre creators in combination with other voices. The resonators of this class of reed are often cylindrical and of short length. They may be half, quarter, or even an eighth length. The Solo or Orchestral reeds are largely imitative of various orchestral instruments, such as Bassoon, English Horn, Clarinet,and Orchestral Oboe.

The type of reed pipe used almost exclusively in the organ is known as the beating reed and must not be confused with the free reed employed in the harmonium and reed organ. The beating reed comprises a vibrating curved tongue, which rolls down the flattened surface of a brass tube called a "shallot". In this flattened surface an opening is cut communicating with the interior of the tube so that, as the tongue vibrates, it opens and closes this opening and thus sets up a sympathetic disturbance of the air column contained within a conical or cylindrical resonator, which communicates with the upper end of the shallot. The shallot, tongue, and resonator are all held firmly by a heavy

block of metal, and the shallot and tongue are enclosed in a socket which has the function of conveying wind from the chest. Tuning is obtained at two points, first by lengthening or shortening the resonator at its upper end, and secondly, by means of a tuning wire which can be adjusted to control the free vibrating length of the tongue.

C. Mutation Stops. The mutation stop is characteristic of the organ, its chief office being for use with a unison or octave rank, or with a combination of such stops, to change the tonal character by artificially bringing into prominence a particular overtone. These ranks greatly increase the tonal variety of the instrument, since a wide range of synthetic qualities is possible.

1. Sesquialtera. This is a mutation stop, combining the octave with the fifth, but it usually includes other harmonics also, such as the third in various octaves. "A Sesquialtera was undoubtedly added to the Positiv of the organ in St. Thomas' Church in 1730 or 1731, by the organ-builder J. Scheibe."[1]

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[1]Pirro, Johann Sebastian Bach, p. 74.

2. Quinte. This is a rank of pipes speaking the fifth above pitch.

D. Mixture Stops. These are also known as compound stops and comprise from two to seven ranks of principal pipes to each note, arranged so to speak the harmonics of the fundamental of a note. There are a great many varieties of Mixtures, but usually the intervals employed are confined to unison and fifth sounding ranks. The Mixtures in common use are Fourniture and Cymbel.

III. Miscellaneous features of the organ.

A. Couplers. This is a device whereby various divisions are made available on one keyboard other than their own. For instance, Coupler Swell to Great makes the Swell organ available on the manual for the Great organ, so that stops from the former can be sounded together with stops from the latter.

B. Organo Pleno, or volles Werk. This means full organ, and in Bach's time it consisted of Principals, Sordunen (the Bourdon of today), Salicionals, Octaves, Quints, Mixtures, Scharffen (small-scale mixture of three ranks) of the Quintadena, Cymbals, Nazard, Twelfth, Sesquialtera, and of Super-octaves, with the Posaunen in the pedal, but not upon the manual.

> The Posaunen are reeds, which are not drawn upon the manual with full organ, where, on account of the higher pitch, they would be too rasping. In the pedal, on the contrary, through the sonority of their tones, they produce a majestic effect, especially in the mouths of the pipes that are covered, as is desirable.

The absence of the reeds from the volles Werk, is from a practical point of view, worthy of perpetuation. These registers were not numerous in organs of that time, at least in Germany, and it must be added badly voiced; they were often nothing but antiquated imitations of the thin and shrill Regal. The reeds were slow of speech, of a sharp, cutting timbre; they would not have blended with the foundation stops combined with the mixtures. The reeds were fitted rather to voice a serious and quiet melody as a solo. [1]

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[1] Pirro, Johann Sebastian Bach, p. 71.

CHAPTER THREE

BACH AND THE ORGAN

"Though Bach never had at his disposal an organ worthy of his skill;"[1] the manipulative techniques that he devised, to make the most of the little that the instrument of his day could offer, were the envy of many of his contemporaries. The major part of his organ experience was divided among four instruments: one at Arnstadt, one at the palace in Weimar, and two at Leipsic.

In 1703 Bach was offered the post of organist in the St. Boniface Church at Arnstadt. He was little more than eighteen years old. Here he had a new organ constructed by the organ builder Wender and finished just one month before he became the organist. It had two manuals and a Pedal organ. The Great organ (Oberwerk: upper manual) had twelve stops, strong in diapason tone, and a brilliant Brustwerk (chest organ) had nine stops, with a coupler to the Great. The manuals, pedals and stop-handles of this historic instrument are preserved in the Arnstadt Museum in their original frame.

The specifications for the Arnstadt organ were as follows:

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[1] Charles Sanford Terry, Bach, A Biography (Humphrey Milford, London: Oxford University Press, 1928), p. 60

OBERWERK

1. Principal 8'
2. Viola da Gamba 8'
3. Quintaton 8'
4. Gedackt (Bourdon) 8'
5. Quinte 6'
6. Octave 4'
7. Mixture 4 ranks
8. Gemshorn 8'
9. Cembal 8'
10. Trompete 8'
11. Tremulant
12. Glocken-Accord (Tuned Bells)

BRUSTWERK

1. Principal 4'
2. Gedackt 8'
3. Spitz-Floete 4'
4. Quinte 3'
5. Sesquialt
6. Nachthorn 4'
7. Mixtur 4 ranks
8. Octave 2'
9. Glocken-Accord
10. Manual-Copp.

PEDAL

1. Principal Bass 8'
2. Sub-Bass 16'
3. Posaun-Bass 16'
4. Violon-Bass 16'
5. Hohl-Floete 8'
6. Pedal-Copp. [1]

For the first time Bach had an organ at his own beck and call, and even though it was not a large one, he made the fullest use of this opportunity to perfect himself. He began to study the works of celebrated organists of the period, and to practice dilligently the most difficult music that he could uncover. It was during this period of his life that he made the celebrated trip to Lübeck to attend the famous 'Abendmusicen' conducted by Buxtehude in St. Mary's Church of that city. Here he drank in the powerful stimuli and great examples of what good music should be, and received commendation and advice from one whose genius was touched by poetic fire. He came back to Arnstadt and "with the inexorable concentration of purpose that distinguished him, he devoted himself absorbingly to the organ. Fired by Buxtehude, his pen, too, was busy." [2]

However, Bach was not too happy at Arnstadt, and in 1707 he accepted a call to the St. Blasius Church at Mühlhausen. Here he remained a few days short of twelve months, for the

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[1] Terry, Bach, A Biography, p. 61.
[2] Ibid. p. 72

city was "torn by religious dissension, Pietism and Lutheran orthodoxy, opposing each other with passionate vehemence." [1] This conflict finally drove him to accept employment which promised more sufficient subsistence than his present stipend afforded, and in 1708 he moved to Weimar as Hof-Organist and Kammer-Musikus to the reigning Duke.

Although the organ at Weimar was small, it was here that he produced the masterpieces that make the Weimar years an epoch in the history of organ music.

The organ at Weimar was inferior to the one he had used at Mühlhausen, but, as we have said before, Bach never had an instrument worthy of his skill. The specifications are as follows: [2]

OBERWERK

1.	Principal	8'
2.	Quintaton	16'
3.	Gemshorn	8'
4.	Gedackt	8'
5.	Quintaton	4'
6.	Octave	4'
7.	Mixture	6 ranks
8.	Cymbel	3'
9.	Tremulant	

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[1] Charles Sanford Terry, "J. S. Bach," Grove's Dictionary of Music and Musicians, p. 158.

[2] Terry, Bach, A Biography, p. 97.

10. Cymbelstern

BRUSTWERK

1. Principal 8'
2. Viol da Gamba 8'
3. Gedackt 8'
4. Trompete 8'
5. Kleingedackt 4'
6. Octave 4'
7. Waldflöte 2'
8. Sesquialtera

PEDAL

1. Gross Untersatz 32'
2. Sub-Bass 16'
3. Posaune 16'
4. Violon 16'
5. Principal 8'
6. Trompete 8'
7. Cornett 4'

After having spent nine years at Weimar, Bach received an appointment as Capellmeister to the Court of Cöthen in 1717. "That he coveted the title Capellmeister is very evident from his later disinclination to surrender it."[1] Bach had nothing to do with the organ service in either of the three churches in the town, but confined himself to the very small and insignificant instrument in the palace.

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[1] Terry, Bach, A Biography, p. 116.

> Its small dimensions and compass would scarcely fit it for any use but that of playing chorales; and this amply sufficed for the requirements of the reformed service. The two manuals had together ten stops; the pedal had three. Although, even in cases where Bach gives at full length the titles he bore at that time, he never calls himself "Hof-organist," it need not be inferred that he never played on this little instrument." [1]

In this organ there was nothing especially noteworthy, except that the pedal boasted of two octaves and a half, from C. to F#, and an eight-foot Trumpet in the pedal. This period is "pre-eminently marked by the production of Bach's chamber music." [2]

The fact that Bach esteemed highly the title of Capellmeister at Cöthen did not deter him from making a change of employment when the education of his children became a matter of concern. To become a mere Cantor after having been a Capellmeister must have been disappointing, but the father in him welcomed the opportunity to get his children out of the Calvinist or "reformed" influence of Cöthen into the Lutheran school of Leipzig. Therefore, when finally the vacant position of cantor of the Leipzig St. Thomas School was offered to him in 1723, a vacancy brought about by the death

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[1] Philipp Spitta, Johann Sebastian Bach (His Work and Influence on the Music of Germany, 1685-1750, translated from the German by Clara Bell and J. A. Fuller-Maitland, London: Novello, Ewer & Co., 1885), Volume II, p. 3.

[2] Charles Sanford Terry, "J. S. Bach," Grove's Dictionary of Music and Musicians, p. 159.

of his friend Kuhnau, Bach accepted without hesitation. Although the position of Cantor did not necessarily imply that he was to play the organ, he nevertheless played frequently. His real duties were to conduct and teach. There were two organs that Bach could use, one at St. Thomas' Church, and the other at the University.

The organ at St. Thomas' Church, Leipzig, had these specifications:[1]

OBERWERK

1. Principal 16'
2. Principal 8'
3. Quintaton 16'
4. Octave 4'
5. Quinte 3'
6. Superoctave 2'
7. Spielpfeife 8'
8. Sesquialtera
9. Mixtur, 6 - 8 - 10 ranks

BRUSTWERK

1. Grobgedackt 8'
2. Principal 4'
3. Nachthorn 4'
4. Nasat 3'
5. Gemshorn 2'
6. Cymbel 2 ranks

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[1] Spitta, "Johann Sebastian Bach," Volume II, p. 283.

7. Sesquialtera
8. Regal 8'
9. Geigen-Regal 4'

RÜCKPOSITIV

1. Principal 8'
2. Quintaton 8'
3. Lieblich Gedackt 8'
4. Kleingedackt 4'
5. Querflöte (Fto. Traverso) 4'
6. Violine 2'
7. Rauschquinte - doubled
8. Mixtur 4 ranks
9. Sesquialtera
10. Spitzflöte 4'
11. Schallflöte 1'
12. Krummhorn (Cremona) 16'
13. Trompete 8'

PEDALS

1. Sub-Bass of Metal 16'
2. Posaune 16'
3. Trompete 8'
4. Schalmei 4'
5. Cornet 3'

The organ at the University church at Leipzig was con-

structed from these specifications:[1]

GREAT ORGAN

1. Gross Principal 16'
2. Gross Quintaton 16'
3. Klein (Small) Principal 8'
4. Schalmei 8'
5. Flute Allemande 8'
6. Gemshorn 8'
7. Octave 4'
8. Quinte 3'
9. Quint-Nasat 3'
10. Octavina 2'
11. Waldflöte 2'
12. Grosse Mixtur (5 & 6 ranks)
13. Cornetti (3ranks)
14. Zink (2 ranks)

SWELL ORGAN

1. Principal 8'
2. Viola di Gamba naturelle
3. Grobgedackt
4. Octave 4'
5. Rohrflöte 4'
6. Octave 2'
7. Nasat 3'

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[1] A. Eaglefield Hull, Organ Playing: Its Technique and Expression (Boston: Boston Music Co., London: Augener Ltd., Fourth Impression), p. 220.

8. Sedecima 1'
9. Schweizerpfeife
10. Largo
11. Mixtur (3 ranks)
12. Helle Cymbel (3 ranks)

CHOIR ORGAN

1. Lieblich Gedackt 8'
2. Quintaton 8'
3. Flute douce 4'
4. Quinta Decima 4'
5. Decima nona 3'
6. Hohlflöte 2'
7. Viola 2'
8. Vigesima nona 1½'
9. Weitpfeife 1'
10. Mixtur (3 ranks)
11. Helle Cymbel (2 ranks)
12. Certin 8'

PEDAL ORGAN

1. Gross Principal 16'
2. Gross Quintaton 16'
3. Octave 8'
4. Octave 4'
5. Quinte 3'
6. Mixtur (a 5 et 6 ranks)
7. Grosse Quinte 6'

8. Jubal 8'
9. Nachthorn 4'
10. Octave 2'
11. Principal 16'
12. Subbass 16'
13. Posaune 16'
14. Trompete 8'
15. Hohlflöte 1'
16. Mixtur (4 ranks)

Probably one of the first things to strike one's attention in the foregoing specifications will be the size and composition of the Pedal organs. The small Arnstadt organ had five stops on the Pedal--one of these of four foot pitch and another of two foot; also a Choir organ possessing only one eight foot stop supported by several Mutation and Mixture ranks. Of the seven stops on the Pedal organ on the Weimar instrument, there were three Reeds, sixteen, eight and four foot pitch, while the St. Thomas organ had four Reeds, one of two foot, and only one Flue stop. In the University organ, however, we find a magnificent Pedal department of sixteen registers, a scheme almost worthy of the master's immortal pedal passages themselves.

The two organs at Leipzig to which he had access were not used too much by Bach, for in his capacity as Cantor he was obligated to direct the singing and to teach. It seems incredible that a man of his virtuosity should not have had

opportunity to play the organ as much as he pleased. His hands and fingers were capable of the most perfect accuracy in performance.

> He had devised for himself so convenient a system of fingering that it was not hard for him to conquer the greatest difficulties with the most flowing facility. Before him, the most famous clavier players in Germany and other lands had used the thumb but little. All the better did he know how to use it. With his two feet, he could play things on the pedals which many not unskillful clavier players would find it bitter enough to have to play with five fingers. He not only understood the act of playing the organ, of combining the various stops of that instrument in the most skillful manner, and of displaying each stop according to its character in the greatest perfection, but he also knew the construction of organs from one end to the other. This latter knowledge he demonstrated particularly on one occasion, among others, at the trial of a new organ in a church not far from which his earthly remains now lie. The builder of this instrument was a man who was in the last years of his long life. The trial was perhaps one of the most exacting ever made. Accordingly, the complete approval which our Bach expressed about the instrument did no slight honor both to the organ builder and, because of certain circumstances, to Bach himself.
>
> No one could draw up or judge dispositions for new organs better than he. But despite all this knowledge of the organ, he never enjoyed the good fortune, as he used to point out frequently with regret, of having a really large and really beautiful organ for his use. This fact has robbed us of many beautiful and unknown inventions in organ playing which he would otherwise have written down and displayed in the form in which he had them in his head.[1]

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[1] Hans T. David and Arthur Mendel, The Bach Reader, A Life of Johann Sebastian Bach in Letters and Documents (New York: W. W. Norton & Company, Inc., 1945) P. 223. Quoted from Agricola, Johann Friedrich, in Adlung's Musica Mechanica Organoedi, Berlin, 1768.

The organs of Bach's time were usually small, with two or sometimes three manuals, plus a pedal organ. About twelve to thirty-five stops were considered sufficient. The pipes were voiced on a light wind pressure and imparted a mellowness of tone that was delightful. It was considered essential that the blending of the various stops into a clear ringing ensemble should result. The pedal was not merely looked upon as a bass to the whole, but was designed to be capable of carrying a melodic line independent of the manuals. The manual divisions were contrasted tonally, for polyphonic music demanded independence and clarity from all sections. Therefore, it was not surprising to find in these instruments an abundance of delightful principals and flutes, together with a good sprinkling of mutations and mixture stops.

For the clearness of musical line, which Bach uses in his organ compositions, it was necessary that his pedal organ be distinct and sharp rather than that it serve as a bass to the whole composition. Constantin Bellermann in 1743 called Bach the

> miracle of Leipzig, as far as music is concerned. For if it pleases him, he can by the use of his feet alone (while his fingers do either nothing or something else) achieve such an admirable, agitated, and rapid concord of sounds on the church organ that others would seem unable to imitate it even with their fingers.[1]

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[1] David & Mendel, The Bach Reader, p. 236.

> Possibly at the time of Bach the keys of the pedals were slightly different from those of our day; undoubtedly in his youth he made much less use of the heel than of the toe, since the pedal keys were extremely short. But he soon recognized the necessity of perfecting the bass keyboard of the organ both by extending its compass and by lengthening the pedal-keys to their present dimensions.[1]

In a great many of the organs in Germany during Bach's life the reeds were present in fairly large numbers. Bach was a great friend of the reeds, a class of stops to which he was particularly partial. He knew how and what to play on them.

Thus we see that the organ of Bach's time was built on a Diapason chorus of principals and flutes, with plenty of mixtures and mutations to give the music brilliance and transparency. Nevertheless, it was the flue-pipe work of the diapason ranks of the organ which formed the backbone of each manual, and each had a generous supply of reeds, mixtures and mutations.

"In both the University Church and St. Thomas Church the organs were tuned to 'chorus' pitch. This was then the usual pitch in Leipzig as well as in other places."[2] Up to the adoption of International pitch in 1889, there existed a confusing variety of pitches.

> The question of pitch has become a real problem particularly in connection with the works of Bach, who frequently had to transpose

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[1] Pirro, Johann Sebastian Bach, Preface.

[2] Spitta, Johann Sebastian Bach, p. 286. Vol. II

> his orchestral and choral parts on account of the different tuning of the organs in different churches, or who had to score woodwind parts in, e.g., C while the parts for the organ, voices, and strings were scored in A (for the voices and strings a different scoring was obviously unnecessary since these could adapt themselves to the pitch of the organ). These discrepancies were caused by the fact that, throughout the Baroque period, different pitches were in use for different ensembles, namely the Kammerton (chamber pitch) for domestic instrumental music, the Chorton (choir pitch, organ pitch) for church organs and, consequently, for sacred choral music. [1]

The pitch of the Chorton, known as chorus pitch was normal for church organs and sacred music, and was regarded as the standard organ and chorus pitch from 1600 to 1820. This pitch approaches our present day B. Consequently, Bach's organ works and his cantatas which involve the organ would sound a semi-tone or even a whole-tone higher to us today if we were to use chorus pitch.

How to recreate the tonal characteristics of the organ upon which Bach played, and for which he has written such a tremendous volume of excellent music, is perhaps one of the most perplexing problems of organ builders today. The eighteenth century instrument, retaining the contrasting and strongly individual characters of its predecessor, was of softer and lighter timbres.

The organ of Bach's time, following a century-old tradition, was composed chiefly of solo stops. The organist would separate the polyphonic parts by presenting each in a distinct

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[1] Apel, Harvard Dictionary of Music, p. 585

tone color, using the stops largely in the same manner in which Bach himself still used the instruments in his church works or large instrumental ensembles.

> In general, it may be said that organ-building in Bach's time had attained to a beauty and richness of tone which have not been surpassed since.[1]

To this rather astonishing statement, of course, many modern organ builders will take exception. But we do know that Bach took advantage of the organs that he had at his disposal and used them to the limits of their capacities.

> His method of registration was so extraordinary that many organ builders and organists were appalled when they saw him.
>
> It seemed to them that such a combination of stops could not possibly sound well; but they wondered greatly when they observed that the organ sounded at its best, though the effect was of an unusual kind that could never have been produced by their own style of registration.[2]

When Bach played at the dedication of the new organ at Mühlhausen, he astonished other organists by the boldness of his tone-combinations.

The first thing that he did when examining an organ was to draw all the sounding stops, getting as much tone out of the

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[1] Albert Schweitzer, J. S. Bach, with a preface by C. M. Widor, English Translation, in two volumes by Ernest Newman, (London: A & C Black, Limited), Volume I p. 200.

[2] Johann Nikolaus Forkel, Johann Sebastian Bach, His Life Art and Work, Translated from the German by Charles Sanford Terry, (London: 1920), p. 20.

instrument as was possible. He liked good reed work, and an organ could never have too much of it to please him. However, we read in Andre Pirro's book on Bach that

> in the organs of Bach's time the reeds were scarcely used except in the capacity of basses, reinforcing the pedal; or as solo registers, for instance, Hautbois and Cromornes; our profusion of sonorous clarions, trumpets and bombardes was totally unknown. Organo pleno did not signify a full battery of 4, 8, 16 and 32 foot stops, but simply the combination of some prestants and mixtures with a diapason or a bourdon. As for a means of varying the intensity of the same tone, such a thing was never thought of.[1]

The commanding genius of Bach was not fully realized during his life. He often had to see much less gifted musicians chosen over his head to fill lucrative posts. His contemporaries accepted indifferently the poetry of his creative soul, ignored the masterfulness of his organ execution, were shocked by his daring technical experiments. What heights of achievement might Bach have attained with one of our superb cathedral organs today! Small credit to our age that we have at last elevated him to the pedestal where he belongs!

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[1] Pirro, Johann Sebastian Bach, Preface

C H A P T E R F O U R

THE EVOLUTION FROM THE BAROQUE TO THE "ROMANTIC ORGAN" OF THE PRESENT DAY

In the eighteenth century we enter upon a period of great activity and marked progress in German organ building. Amidst all the builders of this century, most all of them eminent in their art, Gottfried Silbermann stands as the greatest. He was born in 1683 and lived until 1753. During his lifetime he built many organs, the most noteworthy ones being the instrument in the cathedral at Freiburg which he finished in 1714, and the Frauenkirche organ in Dresden which he completed in 1736. He was building his finest work, the Dresden court organ, when he died. His brother Andreas (1678 - 1734), also an organ designer, built the Strassburg cathedral organ. All the Silbermann instruments, through their technical improvements, attained a beauty and richness of tone which has been difficult to surpass. "It is interesting to note that Bach's contemporaries complained that the Silbermann brothers voiced their organs too softly, in order to get beauty of tone. Bach evidently did not think so." [1] He exalted them in glowing terms. The completeness and absolute beauty of tone that came from the Silbermann pleased the imagination of anyone who could hear how effective a piece of florid and artful counterpoint could sound. The thickness, depth, and independence of the

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[1] Schweitzer, J. S. Bach, Vol. I p. 255.

pedals here vindicated supremely the poetical ascendancy of the fugue over every other class of musical composition.

The Silbermann organ in Freiburg is often cited as the one best suited to reproduce Bach's works. In this instrument we find many reeds which Silbermann had taken over from the French organists, such as cornet, vox humana and cymbal. The tutti was soft, somewhat sombre, and consisted of many closely related, uniformly scaled stops which blended perfectly. However, due to neglect or to repeated repairs over a long period of years the Silbermann organs have today almost ceased to exist.

One of them survives in the Museum at Cologne, which was originally built for the Evangelical Church in Freiburg, Saxony in 1723/4. It contained one keyboard and no pedal. The five registers are as follows:

1.	Principal	4'
2.	Gedackt	8'
3.	Octav	2'
4.	Quinte	1⅓'
5.	Cymbel	2'

The clavier had four octaves - C. c3. It had the characteristic Silbermann quality in the 8' Gedackt, which was so beautiful and gentle. This instrument was tuned one half a tone higher than the Kammerton.[1]

The next fifty years brought little if any progress in

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[1] Wilhelm Meyer, "Katalog Des Musickhistorischen Museums in Köln," Katalog by George Kinsky - Konservator of the Museum. (Köln: Kommissions - Verlag von Breitkopf & Härtel in Leipzig, 1910), p. 305.

organ construction. This was the period when sacred music lost much of its high standing and importance. The uncompromising organ was superseded by the orchestra which was a more flexible medium of expression. Quite understandably organ builders were influenced by the trend toward versatility and many of them tried experiments with novel innovations.

Since the basic nature of the organ is not romantic or free, the instrument necessarily lost its own characteristic sound as soon as an attempt was made to give it a sentimental and limber character.

The builders of organs in the late 1700's and early 1800's pursued the trend of the times and embraced wholeheartedly the approaching Romantic expressiveness for its newfledged freedom. In addition, they gave more scope to their instruments by imitation of the nineteenth century orchestra. Novel gadgets, to enrich and animate the somewhat monotonous Baroque tone color, became fixed patterns in organ construction.

The Abbe Vogler, who in 1789 was Capellmeister to the King of Sweden, exhibited at Amsterdam an organ on a new principle, the invention of which had occupied him for many years. It had the power of crescendo and diminuendo, by means of swell shutters, and though its size was so small that it could be easily carried from place to place, it had four keyboards of more than five octaves, and a pedal clavier of thirty-nine notes. He gave it the name of "Orchestrion." Vogler crowded into his instrument as many amazing effects as he could. He

divided his stops, used a new scaling, and introduced an enormous number of upper partials into each stop. His system of making organs failed, however, since it was found that the proximity of the pipes caused them to project their vibrations into one another, for a pipe requires a certain amount of free space around it in order to speak effectively.

From 1800 up to the present time the strides in organ building have been tremendous. Yet, even as early as 1618 Praetorius had written in his Syntagma Musicum,

> from year to year the art of organ-building improves in an astonishing manner, and we cannot sufficiently thank Almighty God that He has deigned to vouchsafe so great a mercy and gift to man, so perfectum--yes, almost perfectissimum musical instrument as the organ is - - - - -- - - - - - and that He enables us to control with hands and feet such a structure, so that it sounds His praise, adorns His service, and moves mankind to Christian contemplation.[1]

It was after the great men of the Baroque period, Buxtehude, Telemann, Handel and Bach, had made the organ the prized instrument of good music, that the modern trend of building bigger organs was advanced. Since the builders of these instruments tried to imitate the orchestra and its component parts, and since they followed the pattern of the Romanticists in their spirit of unrest and desire for progress, it was inevitable that an entirely new instrument should emerge.

The Swell organ, which had a good deal in common with the

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[1]Michaelis Praetorius, Syntagmatis Musici, Tomus Secundus de Organographia, 1618, (Reprinted in Berlin: F. Trautweinsche FGL. Hof-Buch - U. Musikhandlung, W. Leipziger-Strasse 130, 1884), p. 141.

'Brustwerk' organ of Bach's time, was improved with the addition of a register of flutes. In 1712 Abraham Jordan, in London, built an organ which had an Echo organ, capable of emitting sounds by swelling the notes, so that passages played with expression could be contrasted with those played without. However, this contrivance did not come into vogue in Germany until much later. Even as late as 1885 "an eminent musician, a friend of Mendelssohn and Schumann, who had lived long in England, remarked that she hoped that dreadful invention, the Swell, had not been introduced into Germany." [1]

With the marked progress in organ building, one change here necessitated another alteration somewhere else. As the years advanced, and organs became larger and larger, the touch, in consequence of the great size of the instrument, came to be, of course, very heavy. As a matter of fact, the touch became heavier than the most muscular finger or foot could control without experiencing great physical exhaustion. It was because of this state of affairs that Joseph Booth of England in 1827 attached small circular bellows below each pallet of the open diapason on an organ at Attercliffe. The pipes were mounted on a separate sound-board. The wind passed from the great organ soundboard, by means of conveyances, into the small circular bellows, causing them to pull down the pallets. This innovation was not highly regarded in England, and in 1832, a man named

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[1] C. F. Abdy Williams, The Story of the Organ (London: The Walter Scott Publishing Company, Ltd., Charles Scribner's Sons, 1903), p. 140.

Backer, who had perfected this system, took it over to France where its merits were at once seen and used by the great French organ builder Cavaille-Coll.

This little trick, developed to a high degree in subsequent years, practically dispensed with the old tracker action in organs. The keys did not communicate directly with the pallet as in tracker action, but opened a small valve which admitted the wind to a bellows attached to the pull-down, and the expansion of this bellows opened the pallet. This conveyed the pressure to a second bellows located under the pallet. By this means the console could be placed at a considerable distance away from the pipes.

In the late nineteenth century two types of organs emerged: the German and the French. The Germans tried to mass in their instruments a great quantity of sound, apparently on the principle of the more the better. They also introduced the brass-roller which effected a purely mechanical and predetermined increase of tone. The French, on the other hand, worked out an almost opposite type. They tried to give to each section a definite uniformity of sound. Instead of attempting a continuous crescendo, as the Germans did, the French built up the dynamic climax by adding different groups of sound, one by one. The greatest builder of organs in France was perhaps Cavaille-Coll. His instrument best represents the French organ as a type: namely, a Grande Orgue, for a foundation; a Positiv, or second manual, for brightness; a Recit with swell shutters, for intensity; an additional section of orchestral reeds enclosed in

a separate swell-box, for solo and added effects. Many of these organs are scattered among the cathedrals of France today.

Cesar Franck was undoubtedly one of the greatest French organists, and perhaps it was he more than anyone else who brought French organ playing and music to the heights achieved during the last years of the nineteenth century. He depended especially on the discreet voicing of his organ. His style was piano rather than organ, evidenced in his use of arpeggios and large intervals, and in his preference for the middle registers. The frequent triplets and the indefinitely flowing motion anticipated the impressionist school.

Since the turn of the twentieth century, some of the foremost men of our time, through their unremitting attention, ingenuity, and labours have realized an almost perfect instrument.

Organ building, organ playing, balance, quality and power of tone, marvellous actions and systems of control, development of flue, string and reed tone, acoustics, compass, pitch, tuning, wind pressures and blowing machinery stand prominently out from amongst the multitude of minor subjects and their attendant problems that have called for earnest study.

It is scarcely within the scope of this paper to deal minutely with the innumerable factors or influences under which organ builders labour. However, countless inventions and improvements have been made in organ action, stop control, development and related matters from the combined efforts and searching investigations of men who are specialists in the

field.

In listening to an organ recital, one cannot help but appreciate the great size, power, variety of tone, and the general efficiency of the modern romantic organ. The ear catches at once the completeness of the pedal organ, the intensity of the foundation, string and orchestral tone, as well as the gentleness of the mutation work. One is also impressed with the refinement and variety of qualities in modern flue and reed work. The advent of high wind pressures has made possible many improvements in tone production. Voicers are enabled to obtain promptness in speech, combined with power in string-toned stops. There is great sonority and purity in the diapasons. The reeds offer splendid brilliancy, solidity, and power. The entire general improvement in tone, can be accounted for, through arrival of a perfected mechanical equipment.

C H A P T E R F I V E

THE MODERN BAROQUE, OR "CLASSIC" ORGAN

With the many new voices developed in the modern romantic organ, particularly since the turn of the century, the characteristic tone of the instrument has been practically replaced by an imitation of the symphony orchestra. Consequently, to some Bach adherents that instrument has become unsuited for the rendition of the best music from the organ literature of the seventeenth and eighteenth centuries. The transparency and purity of tone has given way to powerful and dull effects, interspersed with some fine solo voices and sentimental qualities, nice enough in themselves but of limited usefulness.

As a result there has been in recent years a strong reaction, and the Baroque organ has been re-created with fine results. The obvious task of reproducing the tone that will articulate properly the interweaving lines and patterns of polyphonic writing becomes a specific study of timbre, balance, and wind pressure, those factors which gave to the organ of the eighteenth century its characteristic clearness and purity.

This transparency should be maintained when one, two or three ranks are played in combination, or when the full ensemble of the instrument is employed.

Broadly stated, the quality of a tone or sound is determined by the particular development or pattern of the overtones or harmonics in relation to the fundamental tone. A tone,

having the overtones or harmonics strongly developed, tends to make for clarity or transparency and, therefore, all the ranks of pipes in the Baroque organ should possess this common distinction, although the particular harmonic pattern is varied to prevent monotony.

Clarity in the ensemble is obtained by the insertion of groups of pipes which sound a selection of the more important harmonics. In other words, the natural harmonics already referred to are reinforced artificially. This group of pipes is known as Mixture stops. The Fourniture of the Hauptwerk, or Great organ, sounds four overtones when a key is depressed, and the particular overtones are varied throughout the compass of the keyboard, those in the bass and tenor being acute, or high-pitched, and those in the treble more grave. This arrangement gives definition to the lower and usually obscure part of the compass, and brea and fullness to the upper part, which would otherwise become shrill. It will be appreciated, therefore, that as the instrument is built up by the gradual addition of one rank after another, and finally by the bringing into play of the Mixture stops, the tone becomes not merely louder but grows in harmonic intensity.

The importance of the Mixture stop cannot be over-emphasized, for without it, or with a weak mixture, the organ loses much of its brilliance.

> Mixtures are not introduced into an organ as noise-making machines. They do supply additional brilliance and this in turn creates an impression of power. However, mixtures to be most effective should be voiced on the restrained side, and more

> of them employed. A big-scaled and blatant mixture must be repudiated. Just as we find twenty-four first violins moderately played to be more effective in the orchestra than eight violins energetically bowed, so too must we increase the number of mixtures rather than place our reliance on one mixture of overwhelming power.[1]

Another important feature of the classical organ is the tonal and dynamic contrast which exists between the manual divisions. In most of the classical organs there are usually two manuals. Sometimes they have three manuals, but for obvious reasons we will confine ourselves for the present to two. The manuals are the Hauptwerk, or Great organ, and the Positiv, which is the equivalent to our Swell organ. The former, or Hauptwerk, has imparted to it a broad and yet brilliant tone, while the Positiv is generally softer, and yet, is more sprightly. This contrast is necessitated by the fact that the composers of the seventeenth and eighteenth centuries wrote much music in which two separate and distinctive tonal ensembles are employed alternately or antiphonally.

The Baroque composer called for complete independence in the pedal organ, and this department must be capable of sustaining a melodic line at various powers without resorting to the couplers which connect the manual keys with those of the pedals. The pedal department should be amply supplied with stops capable of providing not only an adequate base for the entire instrument but many possibilities for solo-work.

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[1]Hon. Emerson Richards, "Mixtures, Article 3," The American Organist, March 1948, p. 79.

The organ of Bach's time comprised an almost limitless variety of tone color which is produced synthetically by mixing with a foundation stop one or more mutation rank which sound various harmonics or overtones. These mutations differ from the mixtures already described in that there is but one harmonic sounded by each key, and the particular overtone in each case is maintained throughout the compass. The mutation stops can be combined in various ways. The organist is thereby provided with the means of mixing his own distinguishing tone colors.

In the modern romantic organ a large number of the pipes are enclosed in a box, or room, provided with a series of shutters which can be gradually opened or closed at the will of the organist so as to vary the intensity of sound and thereby impart expression to the music. With the instrument of Bach's time and the classical instrument of today, all the pipes are in the open and the expression must be written into the music itself by filling out or thinning down the harmony.

> The reluctance of German builders to accept so important a feature as the Swell is a very curious fact in the history of organ building. We find the pianist Hans von Bülow, writing in 1877 with reference to the organ in the Public Hall, Glasgow, "Hearing the diminuendi and crescendi was to me a new sensation." For a long time even in large modern German organs only the Vox Humana, Oboe, and one or two flue stops were placed within a Swell box, and even as late as 1890 a distinguished German author alludes to the organ crescendo as being "produced from one or two soft stops enclosed in a box with movable shutters" and deprecating such a crescendo as that produced by an orchestra 'as it would rob the organ tone of its majestic passionlessness, and tend to a penti-

> mental or pathetic mode of playing.' The German ideal was an instrument upon which Bach's organ works could be played with dignity and impressiveness even on two manuals. Some of the foremost German organists, such as Merkel and Haupt were fully alive to the importance of the swell, but were never, apparently, in a position to have this improvement effected with regard to the organs upon which they played. Within recent years the Swell department has developed in German organs and the large and powerful instruments of the old builders are gradually being modernized and furnished with composition pedals and pistons.[1]

During the 1920's a movement was begun in Germany to rebuild an organ on the specifications laid down by Praetorius. This experiment was instituted by the well known German musicologist Willibald Gurlitt, Professor at Freiburg, Breisgau. In 1921 E. F. Walker & Co., in Ludwigsburg, Württemburg, displayed in their showrooms the first organ built on these lines. It was called the Praetorius organ, and was later transferred to the University of Freiburg, Breisgau. The wind pressure was very light, and there was no tendency to mix colors. The characteristic tone of this particular organ was light, open and clear. "The work has a strange sound in the Pankett 16', Blockflöte 4', Krummhorn 8'. Particularly startling were the Harpfeife 8' and Geigenregal 4'. It seems that this instrument is suited only for music written before 1650. The only Baroque innovation is the tremolo."[2] The first person to play this in-

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[1]John Matthews, A Handbook of the Organ (London: Augener & Co., 1897), p. 10.

[2]Karl Hasse, "Eine bemerkenswerte vorführung fand am 22. Oktober nachm. 4 Uhr in der Orgelbauanstalt von E. F. Walker & Cie. in Ludwigsburg, (Württb.) statt," Zeitschrift Musikwissenschaft, (November 1921), p. 127.

strument was Karl Straube, when it was dedicated on October 22, 1921.

This attempt at recapturing the quality of the original timbre of old organs was so successful that it was imitated shortly thereafter by the installations of similar instruments at the Universities of Göttingen, Halle, and Königsberg.

In 1929 P. Furtwängler & Hammer of Hanover completed an instrument which was christened the Karl Straube Orgel. This is perhaps the most important one of all those built in Germany. It stands now in the auditorium of the Grassi Museum in Leipzig, and has the following distribution of stops:

HAUPTWERK

1.	Prinzipal	8'
2.	Rohrflöte	8'
3.	Oktav	4'
4.	Gemshorn	4'
5.	Mixtur	4 ranks
6.	Zimbel	3 ranks
7.	Rankett	16'
8.	Krummhorn	8'

BRUSTWERK

1.	Violflöte	8'
2.	Quintadena	8'
3.	Gedacktflöte	4'
4.	Prinzipal	2'
5.	Nachthorn	2'
6.	Blockflöte	1'

7.	Sesquialters	2 ranks	
8.	Regal	8'	
	PEDAL		
1.	Untersatz	16'	
2.	Dulzian	16'	
3.	Schalmei	4'	
4.	Prinzipal	8'	)
5.	Gemshorn	4'	) from Great
6.	Rankett	16'	)

According to Professor Theodor Frayer of the University of Leipzig, who in 1929 gave a lecture on the Karl Straube Organ, the organ of Bach's time is called the Baroque organ, but it has become evident that it is not basically a Baroque organ, but really a Renaissance organ. The instrument of the seventeenth century is unemotional, quiet and transparent, without too many changes, therefore it has the character of the Renaissance.

> The Karl Straube Organ has about twenty ringing stops. Nevertheless it is already now compact in its tonal body, even if earlier amplification might have been possible. For it is as economical as the Baroque organ was. Each one of its stops is an unmistakable entity, which stands by itself, and forms a foundation stop, in which solidity, even a fragment of Renaissance tone seems to chime in, or a full tone with the charm of clear contrasts, or finally a solo stop in its genuine Baroque austerity which has to us become wholly foreign. Each effort to blend discloses new charms and its full organ does not sound muddy, but always allows the single parts to be heard.[1]

[1] Helmut Schultz, "Die Bedeutung der Karl-Straube-Orgel," Die Karl-Straube-Orgel des Musikwissenschaftlichen Institutes und Instrumenten - Museums Der Universität Leipzig, Breitkopf & Härtel, Leipzig 1970. p. 15.

One of the most outstanding Baroque organs in this country is the one at the Germanic Museum, at Harvard University. It was designed and built in 1937 by G. Donald Harrison, in accordance with the principles of organ design prevailing at the time of Bach. This instrument is constructed for the playing of the great classical organ literature of the Baroque period.

> The clear tonal ensemble of the instrument sets forth the rhythmic vitality of Bach's counterpoint with fine clarity. Though the organ is essentially a chorus, a whole palette of solo effects is possible through different combinations of the foundation and mutation stops. Bach's music takes on a new and altogether authentic character when played on this organ, showing that as Bach is the fountain-head of inspiration to composers of all ages, so the general tonal principles of the great 18th century organ builders must inevitably form a foundation of our instruments of today. This is conclusively proved by the fact that all modern music which is contrapuntal in texture gains by performance on this instrument.[1]

The specifications for the Germanic Museum Organ are given below:

HAUPTWERK

Quintade	16'
Principal	8'
Spitzflöte	8'
Principal	4'
Rohrflöte	4'
Quinte	2 2/3'
Super Octave	2'

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[1] E. Power Biggs, "The Organ Music of Bach," Germanic Museum Bulletin, Volume I, Number 6, Cambridge, Massachusetts, March 1938, p. 38.

BOSTON UNIVERSITY
COLLEGE OF LIBERAL ARTS

Fourniture 1 1/3' (IV Ranks)

POSITIV

Koppel Flöte 8'

Nachthorn 4'

Nasat 2 2/3'

Blockflöte 2'

Terz 1 3/5'

Sifflöte 1'

Zimbel ½' (III Ranks)

Krummhorn 8'

PEDAL

Bourdon 16'

Gedackt Pommer 8'

Principal 8'

Nachthorn 4'

Blockflöte 2'

Fourniture 4' (III Ranks)

Posaune 16'

Trumpet 8'

Krummhorn 4' (Positiv)

COUPLERS

Positiv to Pedal

Hauptwerk to Pedal

Positiv to Hauptwerk

Positiv to Hauptwerk 16'

8 General Pistons

Crescendo Pedal [1]

> Although the mechanical and the blowing apparatus of the Germanic Museum organ are entirely modern, the extremely low wind pressures of the organ of the classical period have been employed together with the rich pipe metal, imparting a peculiar mellow quality of tone.[2]

One of the large factors in designing an organ in the days of Bach was the wind supply. Therefore, of necessity, all organs of that time

> were blown on a gentle wind pressure. There were no heavy, fat Flutes and Diapasons. On the contrary, most all stops were light and fanciful in tone. Each one contributed only its rightful share to the ensemble. There were many ranks of pipes sounding the upper partials. These harmonic stops are very vital in the production of organ-tone.[3]

Another baroque style instrument that has been installed with apparent satisfaction is the organ in the Brooks School Chapel, North Andover, Massachusetts. It was designed and built in 1938 by the Aeolian-Skinner Co., under the direction of G. Donald Harrison.

> The chapel in which this organ stands is a simple frame building. It has a seating capacity of only two hundred. Since the organ is used almost entirely for service playing, it was a question of providing an ensemble which would support congregational singing and would

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1 The above specifications were procured personally from Mr. G. Donald Harrison of the Aeolian-Skinner Organ Co.

2 G. Donald Harrison, "The Germanic Museum Organ," Germanic Museum Bulletin, Volume I, Number 6, Cambridge, Massachusetts, March 1938, p. 77.

3 Richard Fey Biggs, "Facts About Registration," The Etude Music Magazine, February 1945, p. 77.

permit the performance of suitable service music.[1]

This organ has twenty stops distributed among three manuals and a pedal. It was decided that the third manual should be an unenclosed Positiv. Therefore, even though the Swell organ is enclosed, with the unenclosed Great and Positiv, this instrument is essentially like Bach's organs. The specifications follow:

GREAT	
Spitzflöte	8'
Bourdon	8'
Principal	4'
Octave	2'
Fourniture	(IV Ranks)
SWELL	
Viola	8'
Rohrflöte	8'
Gemshorn	4'
Cymbale	(III Ranks)
Trompette	8'
POSITIV	
Koppelflöte	8'
Nachthorn	4'
Nazard	2 2/3'
Blockflöte	2'

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1 Maj. Edward W. Flint, "The Baroque Style Exemplified," The Etude Music Magazine, December 1944, p. 691.

Tierce 1 3/5'

PEDAL

Bourdon 16'

Gedacht 8'

Principal 4'

Mixture (III Ranks)

Bombarde 16'

COUPLERS

Swell to Great 16', 8', 4'

Swell to Positiv 16', 8', 4'

Swell to Swell 16', 4'

Positiv to Great 16', 8'

Great to Pedal 8'

Swell to Pedal 8', 4', 2'

Positiv to Pedal 8'

WIND PRESSURE

Manual Divisions $3\frac{1}{2}$"

Pedal Divisions $4\frac{1}{2}$"

Mechanicals

Reversibles to all unison couplers

Pistons: four to each division and
four to the entire organ,
all duplicated by toe studs.

Swell Pedal

Crescendo Pedal

Sforzando piston, duplicated by toe stud.

Tremolo to Swell

Cancels: one to each division and one to the entire organ.[1]

Despite the lack of 16' and 8' principals in the great organ, this stop combination forms the backbone of the entire ensemble. It is true that a chorus of ponderous, hooting, phonon diapasons is a dreary, colorless sound, but principals are by nature brighter than diapasons, and consequently this combination on the great has both a delightful and a pleasing amount of color. The four rank Fourniture is a mixture that gives almost a dazzling, incandescent brilliance to the full organ.

The swell roughly equals in volume the full great organ. However, in color they are nicely contrasted, the swell being much more brilliant and ethereal than the great.

> The unenclosed positiv division represents the most obvious departure from traditional American design. Between the familiar choir organ with its preponderance of dull mezzo-piano unison tone, its negligible mutations and inevitable clarinet, and this spicy chorus in which but one out of five stops is of 8' pitch, there is little comparison. Since the scale of the pipework is generally larger than that of either great or swell, the tone is fuller, denser, and more flute-like; but the harmonic development of the individual stops is sufficient to make the voice leading clear and to insure a satisfactory blend. The 8' Doppelflöte has a hollow liquid quality throughout its register; but unlike a doppel flute, which was common a generation ago, it is neither bulbous nor murky.
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> An intelligent layman, on first hearing

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[1] Maj. Edward W. Flint, "The Baroque Style Exemplified," The Etude Music Magazine, December 1944, p. 691.

> this positiv, remarked on its dramatic quality. Here have been recaptured a series of timbres which have been infrequently heard in Europe since the eighteenth century and which in America have until recently been almost non-existent. These were the "old monorities which delighted a Titelouse" during the greatest period of French organ composition. The mutations provide a tonal palette with such bold colors that beside them the imitative orchestral stops, ingeniously developed by twentieth century American voicers, seem pale and insipid.[1]

Here again we see a definite step taken in the direction of the organ of the eighteenth century, namely, an unenclosed division, with a foundation of one 8' foot stop combined with mutation and mixture stops, which make this part of the organ clear, bell-like, and transparent.

The pedal organ has kept the essential stops of the Bach organ, but, in addition, has added a 16' foot bourdon. However, the bourdon is of mezzo-forte strength, and even though it is too loud for use with the softer manual stops, it serves its purpose well when used with full organ. The use of the lighter and softer manual stops, the 8' gedackt and the 4' principal, together with the three rank mixture, give the bass a definite line that is clear and independent in itself, and can be employed to great advantage in polyphonic music. This pedal organ, even with the 16' bourdon and the 16' bombarde, is never sluggish or monotonous, such as the pedal division in some American organs. Nevertheless, this admirably constructed organ in

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[1] Maj. Edward W. Flint, "The Baroque Style Exemplified," The Etude Music Magazine, December 1944, p. 720.

spite of its limited number of stops and its size adequately suits the building which houses it, and apparently has proved that it satisfies the needs of this school.

Another Baroque organ recently built by the Aeolian-Skinner Organ Company is the one at the Worcester Art Museum, Worcester, Massachusetts. The following are the specifications:

GREAT ORGAN

Quintaton	16'
Bourdon	8'
Principal	4'
Rohrflöte	4'
Fourniture	(III Ranks)

POSITIV

Quintade	8'
Koppel Flöte	4'
Nazard	2 2/3'
Doublette	2'
Tierce	1 3/5'
Larigot	1 1/3'

RECIT

Rohr Flöte	8'
Prestant	4'
Cymbel	(IV Ranks)
Cromorne	8'

PEDAL

Rohr Bourdon	16'

Quintaton	16'	(Great)
Principal	8'	
Quintaton	8'	
Nachthorn	4'	
Blockflöte	2'	
Fourniture		(IV Ranks)
Posaune	16'	
Trompete	8'	
Rohr Schalmei	4'	

COUPLERS

Recit to Pedal

Positiv to Pedal

Great to Pedal

Recit to Great

Recit to Great 16'

Recit to Great 4'

Positiv to Great

Positiv to Great 16'

Recit to Positiv

ARRANGEMENTS OF MANUALS

Great I

Positiv II

Recit III

COMBINATIONS

Great 1 - 2 - 3 - 4

Positiv 1 - 2 - 3 - 4

Recit 1 - 2 - 3 - 4

Pedal 1 - 2 - 3 - 4

General 1 - 2 - 3 - 4

Sforzando Pedal

Here again we see in the Great organ the basic foundation of the sixteen, eight and four foot principals with a four foot flute and a mixture stop of three to five ranks.

The Positiv, which is unenclosed, also possesses the foundation of the eight foot quintade and four foot flute, supported by generous mutation stops. This organ has a delightful, sprightly tone in contrast with the slightly heavier Great.

The Recit is very small with two foundation stops of eight and four foot dimensions, one mixture stop of four ranks, and one eight foot reed stop.

The Pedal division is a trifle unconventional, although it has a sixteen foot Bourdon and a sixteen foot Quintaton. These stops are adequate when the organ is played full, but too heavy for the softer stops on either manual. However, the eight foot principal, or the four foot Nachthorn, or both, is sufficient basis for the lighter stops. There is one mutation stop of two foot dimension and one mixture of four ranks, together with three stops of sixteen, eight and four foot reeds. This pedal division is in itself a complete organ on which the most complicated passages can be heard with clarity and ease.

The whole classic ensemble of organs of the sort which are mentioned above have a very clear, thin, open quality that, if

once heard, will never be forgotten. It is this precise quality that is so necessary for the playing of eighteenth century organ music, in order to hear the inner voices of the polyphony. The clarity of tone, which has been emphasized repeatedly as one of the features of the classic organ, is sadly lacking in many of our modern organs, which instead abound in heavy tones and seem to cast a shadow over the meaning of the music. Therefore, in order not to become monotonous to the listener's ear, the player must alter his registration frequently, and use the swell pedal copiously. But, by contrast the character of the Baroque organ is such, with its light wind pressure, that Bach can be played for a long period without becoming monotonous or tiring to the listener.

Another typical organ that has the characteristics of the Baroque period is the one designed by Mr. Harrison in December, 1939, for use at the World's Fair in New York City. Here again we find the same basic foundation stops with a good representation of mixtures and mutations, together with some bright reed stops. It is a three manual instrument with Great, Swell, Positiv, and Pedal organ. The following are the specifications of that esteemed organ that thrilled so many thousands at the Fair:

GREAT ORGAN

Quintade	16'
Principal	8'
Gedeckt	8'
Octave	4'

Gemshorn	4'
Quint	2 2/3'
Super Octave	2'
Fourniture	(III to IV Ranks)
Scharf	(III Ranks)

SWELL ORGAN

Flute Harmonique	8'
Viola de Gamba	8'
Viole Celeste	8'
Fugara	4'
Cor de Nuit	4'
Nazard	2 2/3'
Hoppel Flute	2'
Dierce	1 3/5'
Plein Jeu	(IV Ranks)
Cromorne	16'
Trompete	8'
Hautbois Clairon	4'
Trepolo	

POSITIV

Quintaton	8'
Salicional	8'
Prestant	4'
Rohrflöte	4'
Nasat	2 2/3'
Octavin	2'
Terz	1 3/5'

Larigot	1 1/3'
[illegible]	1'
Zimbel	(III Ranks)
PEDAL	
Quintaton	16'
Principal	16'
Violon Cello	8'
Rohrflöte	8'
Quint	5 1/3'
Choral Bass	4'
Fagothorn	2'
Mixture	(IV Ranks)
Contra Fagotto	16'
Posaune	8'
Schalmei [1]	4'

In the Great organ we find five stops, the fifteen foot, two eight foot, and two four foot stops carrying the foundation, with two mutation stops of two and two-thirds and two foot dimensions together with two mixture stops, one of three to four ranks of pipes, and the other with three ranks of pipes. This is a particularly brilliant sounding combination, for the seven ranks of mixture adds brightness to the Great ensemble that is clear and climactic.

The Swell organ has a foundation of three eight foot and

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[1] The above specifications were procured personally from Mr. W. Donald Harrison of the Aeolian-Skinner Organ Co.

two four foot stops, three mutation stops of two and two-thirds foot, two foot and one and three-fifths foot, one mixture stop of four ranks, and three reed stops of sixteen, eight and four foot range respectively. Here we have a swell organ that is basically perfect and at the same time is a charming contrast to the Great in point of tone. The three reed stops together with the mixture and mutation stops add a lustre of brilliance when coupled with the Great organ.

The Positiv organ has a foundation of two eight foot, and two four foot stops, with five mutation stops of two and two-thirds, two, one and three-fifths, one and one-third and one foot dimensions, and one mixture stop of three ranks. Here is an organ that can create a feeling of repose and gentleness. Nevertheless, when played together with the Great and Swell, it gives a delightful impression of a different character and musical effect.

The Pedal division has also a surprising amount of individuality. There are, for foundation material, two sixteen and two eight foot stops, with three mutation stops of five and one-third, four and two foot dimensions, one mixture stop of four ranks, and three reeds of sixteen, eight, and four foot respectively. Here is a division that can be distinctly heard in its own department, especially for the bass figures for which Bach wrote so copiously.

The Westminster Choir School, Princeton, New Jersey, houses an organ that has the basic characteristics of the Baroque period. This instrument was built in September, 1938.

Here again we find the foundation stops with mixtures and mutations and some reeds. It is a two manual instrument with Hauptwerk, Positiv and Pedal organ. The following are the specifications:

HAUPTWERK

Gedackt	8'
Spitzflöte	4'
Principal	2'
Zimbel	(III ranks)
Krummhorn	8'

POSITIV

Quintadena	8'
Blockflöte	4'
Spitzflöte	2'
Larigot	1 1/3'
Oktav	1'
Sesquialtera	(II ranks)

PEDAL

Bourdon	16'	
Gedackt Pommer	8'	
Nachthorn	4'	
Krummhorn	8')	from Positiv
Krummhorn	4')	

COUPLERS

Positiv to Great

Positiv	16'

Positiv Unison Release

Positiv to Hauptwerke 16'

Hauptwerke 16'

Hauptwerke Unison Release

Hauptwerke to Pedal

Positiv to Pedal

COMBINATIONS - Fixed

Hauptwerk - 1, 2, 3, 4, C

Positiv - 1, 2, 3, 4, C

Crescendo Pedal

Here we find a small but compact organ. The Hauptwerk has one eight foot principal, one four foot string tone, and one two foot mutation, one mixture stop of three ranks, and one reed of eight foot. This is a pleasing combination of brightness and clarity, for we have no heavy cumbersome stops to weigh down the tone.

The Positiv has two foundation stops of eight and four foot, one string stop of two foot, one mutation stop of one and one-third foot, one mixture of one foot, and one mixture of two ranks. Here we have a Positiv that is light in texture and yet is a splendid contrast to the Hauptwerk in toral balance. The Pedal organ is surprisingly heavy in foundation stops for we have a sixteen foot, and eight foot and a four foot principal, together with two reeds, eight and four foot. When this Pedal division is coupled to the Hauptwerk, and/or to the Positiv it will have a delightfully clear and distinct tone that is so

necessary to the performance of Baroque music.

There have been discussed in this chapter one German and five American organs that represent the modern Baroque organ. They are typical of the instrument on which the music of the seventeenth and eighteenth century is performed today with much success.

Strangely enough the initiative in this Baroque movement seems to be shared by German and American organ builders only, there being no interest manifested in this direction, to our knowledge, among either English or French organ designers today.

C H A P T E R S I X

SIMILARITIES AND DIFFERENCES

According to Web ter's Dictionary a comparison is "a relative estimate; it usually implies - - - that the objects compared belong to the same class, or are more alike than different." This definition applies particularly well to the case in point, for when we line up the common characteristics of the Bach and modern Baroque organs, we shall find that they are much more alike than they are different. Interestingly enough most of the similarities could be classified as functional, while the differences prove to be chiefly mechanical.

In character the organ of Bach's time and the modern Baroque are essentially the same. That is, they both employ a foundation of flue or principal stops, knit together with plenty of mixture and mutation stops. This combination gives to the entire ensemble the clarity and brilliance that has made the Baroque instrument a model for the latest fad in organ building.

In a personal interview with Mr. G. Donald Harrison, the designer of the five American Baroque organs, I ask if the organ of the Germanic Museum was an exact copy of the St. Thomas Church, Leipzig, instrument, to which he answered, "No, but it is similar to organs of Bach's time." To be sure, when the specifications of the modern instruments are examined in detail, we find that they all posses well-balanced foundation

stops, mixtures and mutations, with a sprinkling of reeds. If we examine the individual organs for which the specifications have been given above, we shall find that they are similar to the Baroque of the seventeenth and eighteenth centuries in structure, but no two are duplicate.

Bach gave special attention to the improvement of the organ wind-chest and bellows. Since the wind is the life-blood of the organ, the factor of wind supply had much to do with the designing of the early Baroque organ. As this was long before the days of electricity or power driven motors and blowers, the wind pressure was of necessity low, because the bellows had to be pumped by manual labor. But since high pitched ranks of pipes could produce a great deal of sound from very little wind, the low pressure that the Bach organ had was sufficient. Therefore, the pressure of two and one half inches, or three inches at the most, gave this type of organ that delightful, clear, rich, transparent quality, which is practically impossible to get with a forced or heavier pressure. Consequently, because of the low wind pressure, the tonal result is one of blaze, brilliance, and cohesion rather than one of impact, power, and force. "The organ of Bach's time, which we term 'baroque' was very limited in 8-ft registers as there was not enough bellows to blow them."[1] The light wind pressure gives a brilliance and lightness of tone that

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[1] Ernest M. Skinner, "Letter from Our Readers," The Diapason, II (1948), p. 15.

cannot be had from an instrument of high pressure.

From the specifications listed above we notice that the Great organs in all of the instruments, both Bach's and the modern, except for the Brooks School, and the Westminster Choir School, have a sixteen foot quintaton. Each of these has an eight foot principal. Here then, we have the first concrete basis on which to build the premise that the modern baroque is similar to the organ of Bach's time. For here is the foundation on which all organs should be constructed; that is, a good solid groundwork of principal, or diapason chorus. From this point there may be additions to the foundation work, as some of the specifications designate, that is, one or two more stops of sixteen, eight, or four foot dimensions to give more body to the basic principle of a diapason chorus. To this diapason chorus are added the mutation stops which give color to the ensemble. It will be noticed in the specifications that they are not all of the same pitch or foot dimensions, but they are present in all the organs in varying degrees and numbers: Quinte 6', Octave 4', Quinte 3', Superoctave 2', Sesquialtera, Quint-nasat 3', Octavin 2', Quinte 2 2/3', Octave 2'. These ranks greatly increase the tonal variety of the instrument since a wide range of qualities is possible. One or a combination of these stops will be found in the Great organs that have been discussed here. As an additional color supplement, the mixture stops may be employed to great advantage. All of the Bach organs had mixtures of various ranks: Mixtur 4 to 10 ranks, Cymbel 2 or 3 ranks, Grosse Mixtur 5 and 6 ranks,

Cornetti 3 ranks, Zink 2 ranks. The modern Baroque organs, on the other hand, have mixture stops of corresponding character, but they are termed Fournitures of varying degrees, from three to five ranks, or Scharfs, of varying degrees, of three ranks. Thus again, we see that the Great organs in both the old and the modern instruments have three features in common. They all have foundations of diapason choruses, generous complements of mutations, and mixtures of many ranks.

The Positiv, or Choir, organ has the same set up -- its foundation, mutation, and mixture stops -- but its texture is lighter in order to give a necessary contrast. All of the eleven organs, old as well as new ones for which we have submitted specifications include the Positiv section in their make-up, and all of them have to a greater or lesser degree the same types of stops. In every case we find one or more eight foot principal stops from the following assortment: Quintade 8', Lieblichgedackt 8', Principal 8', Viola di Gamba 8', Gedackt 8', Trompete 8', Quintaton 8'. These stops form the diapason foundation for the Positiv organ around which the mixtures and mutations are built. The mixture stops in the Positiv are not so numerous, and indeed, some of the Positiv organs mentioned above do not have a mixture stop at all. Such is the case in the Worcester Art Museum, Brooks School Chapel, and the old Weimar instruments. When mixtures do occur in the Positiv, as happens in the cases of the other six organs, they are designated by the names Mixture 2, 3, and 4 ranks and Zimbel 3 ranks. The fact that the number of mixture stops in the Positiv is

kept at a minimum as compared to the Great, results in a clearer, more ringing quality for this smaller and softer organ. In examining further the Positiv of these organ designs, we find that, even though mixtures have been in certain cases omitted, a goodly share of mutation stops appear in every instance. These tend to reinforce the harmonics of the unison, and add an unclouded timbre to the basic foundation stops. Were we to review the mutation stops that are common to all of the organs here mentioned, we should notice these: Sesquialtera, Weitpfeife 1', Vigesima 1½', Viola 2', Nazarard 2 2/3', Doublette 2', Tierce 1 3/5', Larigot 1 1/3', Blockflöte 2', Sifflöte 1', Octavin 2', Decima nona 3', Rohrflöte 2'. The mutations provide the Positiv organ with bold colors that are perfectly blended into the whole ensemble, and give added lustre to the other manuals when played with or against them.

Two of the Bach organs (the St. Thomas and the organ at the University), and three of the modern Baroque organs (the Worcester Art Museum, World's Fair, and the Brooks School Chapel), have Swell organs. This is the section that usually provides an effective contrast to the Great organ, and also lends a very valuable expressiveness to the instrument. Here also we find the basic foundation of principal stops, knit together with mutations, mixtures, plus reeds. Among the foundation stops are Rohrflöte 8', Grobegedackt 8', Principal 8', Flute Harmonique 8', Viole da Gamba 8', Viola Celeste 8', Principal 4', Nachthorn 4', Rohrflöte 4', Prestant 4',

Fugara 4', Cor de Nuit 4', Octave 4'. These provide excellent contrast with the Great organ for they are not so heavy and dark as those of the Great. For mutation stops the Swell is equipped with Nasat 3', Sesquialter, Octave 2', Sedecima 1' Schweizerpfeife, Largo, Nazard 2 2/3', Koppel Flöte 2', Tierce 1 3/5', which add the necessary harmonics for the Swell organ. For mixture stops in the Swell we find Cymbel 2, 3, and 4 ranks, Mixtur 3 ranks, and Plein Jeu 4 ranks. Through the use of these mixture stops a clear, pristine color is added to the mutation and foundation combination which forms an excellent and sharp contrast to the heavier and not so brilliant Great organ.

The Pedal organ, too, has its own departments of foundation, mutation, mixture, and reed stops. Because Bach wrote such brilliant passages for the bass sections in his organ compositions, it was necessary to have a pedal division that could handle a melody all of its own. This was quite possible with the unique properties of his Pedal structure. On all of the Pedal organs we find one or more of each of sixteen, eight, or four foot principals. The mutation work on the Pedal organs are Blockflöte 2', Flöten-Bass 4', Quinte 3', Grosse Quinte 6', Quint 5 1/3', Choral Bass 4', Nachthorn 2'. The mixtures comprise these stops: Mixtur 3 to 6 ranks, Fourniture 3 or 4 ranks. For Reed stops we find Posaune 16', Trumpet 8', Krummhorn 4', Rohe Schalmei 4', Contra Fagotta 16', Schalmei 4', Cornet-Bass 2', Cornet 2'. In Bach's University Church set-up there was a

magnificent Pedal department. It was larger than the Pedal organs in any of the other ten instruments examined, containing in all, sixteen substantial stops (of which six were foundations), cemented together with adequate mutations, mixtures, and chorus reeds. This instrument, because of its generous proportions, the adequate scaling, voicing, and regulating of its pipes, offered Bach perhaps the best opportunities that he ever enjoyed as an organist.

It is important to remember that the whole diapason structure forms the backbone, or foundation, of the organ. If this basic element of the instrument is perfect, and if there is added to it a good set of mutations, mixtures, and reeds, harmonically developed and logically balanced, an instrument of excellent quality should result.

We have examined the specifications of eleven organs. Four of the instruments are the ones on which Bach played, and one/a Silbermann organ; the other six are comparatively new, one of them having been built in 1929, three in 1938, one in 1939, and the other as late as 1942. The basic pattern of the Baroque organ, from which its modern counterpart has been so masterfully reproduced, embodies a timbre that is both soft and light. Individuality and homogeneity in the tonal structure have been achieved, so that the instrument can sound the various episodes in the complicated architecture of the preludes and fugues simply and clearly. The clarity and independence of the manual divisions contrast with each other as is so delightfully

necessary in polyphonic music. The modern Baroque instruments, however, need not be limited to this type of composition, for our "modern music with its complex harmony is admirably suited to the transparency of the classical toned organ, and provided the Swell and Choir are present, we have an ideal arrangement for its rendition."[1]

Tonally, then, the modern Baroque organ is essentially the same as the organ of Bach's time. We have tried to reveal how the foundation of the diapason chorus with a sprinkling of mutations and mixtures make up the ensemble of both types of organs. This is true not only of the manual divisions but also of the Pedal, which department is in itself designed to carry a melodic line independent of the manuals. When we add that the instruments are voiced on comparatively low wind pressure of from two and one half to three inches, that the reeds are not shrill, that the mixtures and mutations are marvelously brilliant without shrieking or even seeming unduly protruding, that the element of cohesion and blend has been kept in mind throughout all the voicing, the similarities between the two certainly make them "blood relations."

The differences between the Bach organs and the modern Baroque are slight indeed, and as stated previously they are of a mechanical rather than functional nature. The material in the following paragraphs is pertinent only to the degree in

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[1] G. Donald Harrison, "Organ," Harvard Dictionary of Music, p. 529.

which it applies to tonal ensemble. In overcoming the gauche limitations in manipulative construction, common to all the instruments of the seventeenth and eighteenth centuries, Bach proved himself the paramount organ master that he was.

In the first place, none of Bach's organs had the use of the swell-box. Every section of the instrument was entirely in the open. This arrangement proved entirely satisfactory since the wide contrast in timbre, produced by the individual voicing of each of the sections, gave ample expression and color in performance. This faculty of the Baroque is stoutly corroborated today by the exponents of the "Back to Back" school and is in itself a powerful argument for their cause. The Brooks School Chapel organ, alone among the modern Baroques considered has the Swell enclosed. The others all follow their old prototype in Germany.

Couplers on the old Baroque instruments were few. The Arnstadt organ had one manual coupler and one pedal coupler. The St. Thomas Church organ had two manual couplers. The University Church organ, however, had quite an interesting array of extra stops and couplers:

Ventils (To the Hauptwerk
(To the Brustwerk
(To the Side Basses

(To the Brust and Manual * [1]
(
Ventil (To the Stern
(
(To the Hinterwerk

A Bell to Bell and Clower

Because of manipulative difficulties, the Baroque organ of the seventeenth century seldom had more than unison couplers; i.e., Swell to Great coupler. With the old tracker action, this was all that was possible without making the weight of the action so heavy as to render the organ almost impossible to play. With the modern Baroque instrument, this problem has been made quite easy, since with electric action we have an array of couplers that can join all of the manuals at unison, 16', 8', and 4'. This added faculty is one of the essential differences between the modern Baroque and its ancestor in Germany. The use of electricity enables the organist to operate the manuals just as easily whether uncoupled or coupled throughout.

The pedal board is another feature that modern organ builders have improved almost beyond recognition since the early Baroque period. Bach, in his youth, undoubtedly made much less use of the heel than of the toe, for the pedal keys were very short. Nevertheless, he recognized the necessity of perfecting the bass keyboard by lengthening the pedal keys and by extending the compass of the whole board. The organ at

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[1] Spitta, J. S. Bach, I. 285.

*The meaning must be that there was a Ventil between the Pedal and Manual of the Brustwerk.

Arnstadt had a flat pedal board with a range of twenty-four notes, or two octaves. Undoubtedly, this limited Bach in the bass range of his organ music. The St. Agnes Church in Weimar had an unusual pedal range compared to the others. It extended for two and one half octaves, up to F♯. Andre Pirro associates the St. Agnes pedal board with Bach's Prelude (Toccata) in F major, where that range is necessary. Then too, the chorale prelude, In dulci jubilo, from the Orgelbüchlein, touches an F♯ in the pedal, and can perhaps be traced to this period of Bach's life. The modern pedal board of thirty-two notes, used on the modern Baroque organ, is properly placed in a central position with regard to the manuals, instead of C under C as was common under the shorter compass pedal boards. Moreover, the radiating concave board, which is recommended by the American Guild of Organists, according to their specifications, is used by nearly all modern organ builders today. The above mentioned modern Baroque instruments are fitted with the radiating concave pedal board.

With the advent of electricity, devices and inventions too numerous to mention have been perfected. Couplers and pistons both foot and manual, that work by the slightest touch, can unite the whole organ into one integrated unit. Staccato playing is possible even though the pipes are a good distance from the console. All of these added facilities, to say nothing of the new discoveries in metallurgy applicable to pipe composition, have made possible unheard-of dimensions in the field of organ

construction.

The advocates of the modern Baroque organ believe that the production of tone, embodying a proper harmonic development and an adequate balance of ensemble in the foundation chorus through the use of harmonic corroborating stops, such as mutations, mixtures, and chorus reeds, is the ultimate goal in organ construction for the complete enjoyment of the polyphonic music from Pachelbel, Buxtehude, and Bach. Of course, the sponsor of the modern romantic organ will retort that this is sheer retrogression. We are not taking advantage of new discoveries and inventions in organ design by recreating the seventeenth and eighteenth century pattern. "The music of modern composers such as Franck, Karg-Elert, and Vierne simply cannot be played effectively on a Baroque style organ," they will assert. Conversely, the music of the contrapuntists cannot be played effectively on the modern romantic organ. The only answer is inevitable, -- a combination instrument.

CHAPTER SEVEN

CONCLUSION

The foregoing chapters have been an attempt to bring to the attention of the reader some observations regarding the vital characteristics of the modern Baroque organ. In comparing the present instrument with the one of Bach's time we have traced somewhat cursorily the growth in organ building from the earliest germs in the pipes of Pan up to the massive instruments in our present day cathedrals, both here and abroad. The salient features of the five instruments of Bach's time have been laid in the open, side by side, and we have exalted them as the zenith of their time, since through the music of that great father of the organ, they produced a loftiness of expression heretofore unparalleled. We have emphasized how the polyphonic music of that century achieved a transparency of expression, through unique stop combinations and light wind pressure, which appeals clearly to us even in our time.

In our allusion to the "romantic" instrument of the nineteenth and twentieth century, we have lauded the progress obtained in tone color and expressiveness through new volume controls, where, by means of crescendos, diminuendos, solo and echo effects, extraordinary interpretation and poetic articulation know no limits.

With the advent of new inventions a great controversy has

ariven as to the correct playing of Bach's music. Bach had no experience with the Venetian or swell shutter, which was introduced into England around 1712. It no more occurred to Bach than to the rest of his contemporaries that some day organs would be fitted with combination stops, adjustable combinations, and all the rest of the apparatus of the modern organ, especially the so-called concert organ. How, then, must we regard a performance of the works of Bach on the modern organ?

Even though we have achieved infinite possibilities in registration, the power of gradual variation from pianissimo to fortissimo, and by means of the swells, a certain power of tone nuance, we seem to have lost the old timbre of the organ for which Bach wrote. Since the tone is the chief thing, it would therefore seem that the modern organ is not so suitable for Bach playing as is generally supposed. Our registers are all voiced too loud or too soft. If the whole of the diapasons and the mixtures are pulled on, or if we add the reeds, we get a force of tone that becomes unbearable to many listeners. The lighter manuals are weak in comparison to the great organ, and they usually lack the necessary mixtures and mutations. Our pedals are coarse and clumsy and are poor in mixtures as well as in four foot stops. The relation between diapasons and mixtures has been altered, wholly to the detriment of the latter, and the unnaturally strong bellows gives the modern romantic organ a forced tone. In our passion for strength of tone we have forgotten beauty and richness of tone, which re-

sults solely from the harmonious blending of ideally voiced stops.

Since 1920 there has been, and there is a strong tendency in the direction of the Bach type of organ tone. Moreover, some of our modern builders, in sympathy with the Bach tone ideals, are making concerted efforts to construct a satisfactory, tonally equipped, instrument, which would make the Baroque type of organ ensemble more effective and in more urgent demand. One of our most ardent Baroque organ enthusiasts says that he

> shares with most English organists and builders the idea that a good organ must first and foremost be one on which the compositions of Bach can be played satisfactorily. This seems to be sufficient for many Englishmen. He goes further than this, and agrees with our American organists and builders in wanting a wealth of beautiful color, as is produced by lovely Solo Reeds, Flutes, Strings, and similar stops after the foundations have been provided.[1]

Nevertheless, in spite of the remarkable improvements that we have experienced in the last fifty or hundred years, the fact still remains that Bach's music, and the music of his contemporaries cannot be played on the modern organ with any semblance of the lofty simplicity with which this music should be performed. Instead it is covered muddy, indistinct and confused. Part of the reason for this state of affairs is the elimination of the natural color from the diapason work and chorus reeds of the modern romantic organ in this country.

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[1] William Harrison Barnes, The Contemporary American Organ - Its Evolution, Design and Construction (New York: J. Fischer & Bro., 1929), p. 156.

This naturally eliminated the octave and mutation work, or made it unobtrusive, of no practical value. As a result, we have produced an organ which has the flutey 'woofy' tone which would be desirable in a theater organ. Happily, however, the last thirty years of organ building have turned back to the Baroque "instrument in order to make possible the proper performance of the greatest organ music ever written." [1] In 1921 the German musicologist Willibald Gurlitt, after a thorough study of the Praetorius works, had an organ made by E. F. Walker & Co., in Ludwigsburg, Württemburg, which was based entirely upon Praetorius' specification and scaling. This reconstruction has considerably influenced the whole organ building industry today. Shortly after this reactionary experiment in Germany, an American exponent in the field, G. Donald Harrison of the Aeolian-Skinner Organ Company, Inc., at Boston, Massachusetts, began pioneering in the return to an instrument that may be worthy of the name pipe organ. He did not, however, exclude from his specifications any of the really good inventions of the modern organ, but tried to incorporate them, with a good deal of success, into his new combination instrument.

At present there seem to be three distinct factions in organ building: The first group has swung completely over to the Baroque organ; the second insists on making the purely modern romantic organ; the third, which is in between these

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[1] Apel, Harvard Dictionary of Music, p. 532.

two camps, believes that the Baroque of the seventeenth century and the modern romantic organ can be combined. Probably when the smoke clears and all three factions have satisfied themselves as to the merits of the other, a new era in organ building will be inaugurated, and we shall in the long run benefit immensely from the studies of the three camps. The Baroque organ enthusiasts proclaim that the music of Bach and his precursors cannot be played on the modern organ. In like fashion the modern builders claim that modern music cannot be played on the Baroque organ. Somewhere here we ought to find a happy medium that will suit everyone, but as yet this hoped-for solution has not been reached.

BIBLIOGRAPHY

I. Books

Apel, W., Harvard Dictionary of Music. 1st ed; Cambridge: Harvard University Press, 1944.

Barnes, W. H., The Contemporary American Organ - Its Evolution, Design and Construction. New York: J. Fischer & Bro., 1937.

Bukofzer, M. F., Music in the Baroque Era - From Monteverdi to Bach. New York: W. W. Norton & Company, Inc., 1947.

David, H. T., and A. Mendel, The Bach Reader - A Life of Johann Sebastian Bach in Letters and Documents. New York: W. W. Norton & Company, Inc., 1945.

Ferguson, D. N., A Short History of Music. New York: F. S. Crofts & Company, 1945.

Finney, T. M., A History of Music. New York: Harcourt, Brace and Company, 1935.

Forkel, J. N., J. S. Bach, Life, Art and Work. Translated By C. S. Terry; London: 1920.

Galpin, F. W., A Textbook of European Musical Instruments - Their Origin, History and Character. New York: E. P. Dutton and Company, Inc., 1937.

Geiringer, K., Musical Instruments - Their History from the Stone Age to the Present Day. Translated by Bernard Miall; London: George Allen & Unwin Ltd., Museum Street, 1943.

Grove, G., Dictionary of Music and Musicians. 3rd ed. Edited by H. C. Colles; New York: The Macmillan Company, 1936.

Hull, A. E., Organ Playing: Its Technique and Expression. 4th impression. London: Augener Ltd.

Whitland, A. J. F., The Age of Bach and Handel. The Oxford History of Music; London: Clarendon Press, 1902.

Matthews, J., A Handbook of the Organ. London: Augener Ltd., 1897.

Mc Kinney, H. D., and W. R. Anderson, Music in History - The Evolution of an Art. New York: American Book Company, 1940.

Pirro, A., Johann Sebastian Bach - The Organist and His Works for the Organ. Translated by M. Goodrich; preface by C. M. Widor; New York: G. Schirmer & Company, 1902.

Praetorius, M., Syntagmatis Musici, Tomus Secundus de Organographia, 1618. Reprint: F. Trautwein'sche HGL. Hof-Buch.-U. Musikhandlung; Berlin: 1884.

Sachs, Curt, The History of Musical Instruments. New York: W. W. Norton & Company, Inc., 1940.

Schweitzer, A., J. S. Bach. Translated by Ernest Newman; London: A. & C. Black, Ltd., 1923.

Skinner, E. M., The Modern Organ. New York: The A. W. Gray Company, 1917.

Spitta, P., Johann Sebastian Bach - His Work and Influence on the Music of Germany, 1685-1750. Translated from the German by C. Bell and J. A. F. Maitland; London: Novello, Ewer and Company, 1884.

Music Lovers' Encyclopedia. Compiled by R. Hughes; completely revised and newly edited by D. Taylor and R. Kerr; Garden City, New York: Garden City Publishing Company, Inc., 1939.

Terry, C. S., Bach - A Biography. London: Oxford University Press, 1928.

Williams, C. F. A., The Story of the Organ. London: The Walter Scott Publishing Company, Ltd.

II. Articles

Barnes, W. H., "Would Combine Two Schools of Design in an Eclectic Organ," The Diapason, 39th year, No. 2:14, January 1, 1948.

Biggs, R. P., "Facts about Registration," The Etude, 64, No. 2:77, February, 1946.

Flint, L. W., "The Baroque Style Exemplified," The Etude, 62, No. 12:691, December, 1944.

Gunn, G. D., "The Bach Organ - a Museum Piece?" Musical Digest, 29, No. 16:15-16, 40, December, 1947.

Harrison, G. D., "The Germanic Museum Organ," Germanic Museum Bulletin, 1, No. 6, March, 1936.

Hasse, K., "Eine bemerkenswerte vorführung fand am 22. Oktober nachm. 4 Uhr in der Orgelbauanstalt von E. F. Walker & Cie. in Ludwigsburg (Wrttb.) statt," Zeitschrift für Musikwissenschaft, November 1921.

Heyer, Wilhelm, Katalog des Musikhistorischen Museum in Köln, by George Kinsky, Breitkopf & Härtel, Leipzig, 1910.

Richards, E., "Mixtures - the Conclusion: Article 3," The American Organist, 31, No. 3:79-81, March, 1948.

Skinner, E. M., "Mr. Skinner Looks to the Future," The Diapason, 39th year, No. 2:15, January 1, 1948.

Schultz, H., Die Karl-Straube-Orgel, Breitkopf & Härtel, Leipzig, 1930.

Williams, A., "An Iconoclast on Bach; Musicologists to the Rescue," Boston Herald

Wood, D. T., "Sees More Variety in Classical Organ Than in Romantic," The Diapason, 38th year, No. 11:35, October 1, 1947.

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